

REMARKS

Claims 1-38 remain pending in the application.

Claims 1-38 stand rejected under 35 USC §112 as failing to comply with the written description requirement. Specifically, the Examiner contends that claims 1, 9, 16, 27 and 33 contain subject matter which cannot be found in the originally-filed specification. Applicant respectfully requests reconsideration of the §112 rejections.

Referring to claim 1, the support for the various recitations of such claim is in the originally-filed specification at the following locations:

A photolithographic method forming overlapping exposure patterns on a photosensitive material from light passed through the single reticle; with the reticle being displaced relative to the photosensitive material between a first exposure to a first light and a second exposure to a second light so that a first pattern of the first light produced by the first exposure is offset and overlapping on the photosensitive material relative to a second pattern of the second light produced by the second exposure -- supported at, for example, figures 3-8, with figure 8 showing a photosensitive material 30 having a first pattern of circular portions 50 exposed by first radiation (first light) passing through a reticle, and a second pattern of circuit portions 70 produced by second radiation (second light) passing through the same reticle after the reticle has been displaced relative to the photosensitive material, with the second pattern offset and overlapping the first pattern;

the first and second patterns comprising regions of the photosensitive material exposed to the first and second light, respectively, and regions of the photosensitive material unexposed to the first and second light, respectively -- supported at, for example, figure 8 showing circular portions 50 and 70 corresponding to regions of the first and second patterns, respectively, exposed to the first and second light; and also showing unexposed regions 52 of photoresist 30 between the circular portions 50 and 70; and

either an entirety of the exposed regions from each of the first and second patterns being extended entirely through the photosensitive material or an entirety of the unexposed regions from each of the first and second patterns being extended entirely through the photosensitive material -- supported at, for example, figure 10 and the description at paragraph 0046 where it is indicated that either the exposed portions 50 and 70 of photoresist 30 can be removed relative to the unexposed portions 52, or vice versa.

Claim 1 is thus supported by the originally-filed application.

Referring next to claim 9, the support for the various recitations of such claim is in the originally-filed specification at the following locations:

a single reticle is utilized to form overlapping first and second exposure patterns on a photosensitive material from electromagnetic radiation passed through the single reticle with the first exposure pattern of the radiation comprising features separated by about a minimum feature

spacing that can be accomplished with a single reticle exposure during the photolithographic processing; and with the overlapping first and second patterns comprising features separated by less than said minimum feature spacing, the first and second patterns comprising regions of the photosensitive material exposed to the first and second electromagnetic radiation, respectively, and regions of the photosensitive material unexposed to the first and second electromagnetic radiation, respectively; -- supported at, for example, figures 3-8, with figure 8 showing a photosensitive material 30 having a first pattern of circular portions 50 exposed by electromagnetic radiation passing through a reticle, and a second pattern of circuit portions 70 produced by electromagnetic radiation passing through the same reticle after the reticle has been displaced relative to the photosensitive material, with the second pattern overlapping the first pattern; and also supported by paragraph 0044 which explains that the reticle utilized to form portions 50 and 70 can have feature patterns spaced by a minimum feature spacing, and that the exposed portions 70 and 50 can correspond to features separated by less than such minimum feature spacing;

either an entirety of the exposed regions from each of the first and second patterns being extended entirely through the photosensitive material or an entirety of the unexposed regions from each of the first and second patterns being extended entirely through the photosensitive material; -- supported at, for example, figure 10 and the description at paragraph 0046

where it is indicated that either the exposed portions 50 and 70 of photoresist 30 can be removed relative to the unexposed portions 52, or vice versa.

Claim 9 is thus supported by the originally-filed application.

Referring next to claim 16, the support for the various recitations of such claim is in the in the originally-filed specification at the following locations:

providing a semiconductor substrate having a photosensitive material thereover -- supported at, for example, figure 9, showing a substrate 26 having a photosensitive material 30 thereover;

passing electromagnetic radiation through a reticle to form a first pattern of the radiation on the photosensitive material; the first pattern comprising regions of the photosensitive material exposed to the first electromagnetic radiation and regions of the photosensitive material unexposed to the first electromagnetic radiation; the reticle having a first dimension along a first axis -- supported at, for example, figures 3-8 and 9, showing a reticle 10 utilized to form a first pattern comprise exposed circular portions 50 and unexposed portions 52, and showing the reticle having a first dimension "Q" along a first axis "X";

displacing the reticle relative to the semiconductor substrate along the first axis by an increment less than the first dimension of the reticle -- supported at, for example, figure 5;

after the displacing, passing the electromagnetic radiation through the reticle to form a second pattern of the radiation on the

photosensitive material; the second pattern comprising regions of the photosensitive material exposed to the second electromagnetic radiation and regions of the photosensitive material unexposed to the second electromagnetic radiation-- supported at, for example, figures 6, 8 and 9 showing a second pattern 34 comprising regions 70 exposed to the electromagnetic radiation passed through the reticle after the displacement of the reticle, and also having portions of region 52 which have not been exposed to the radiation passed through the reticle;

extending either an entirety of the exposed regions from each of the first and second patterns entirely through the photosensitive material or an entirety of the unexposed regions from each of the first and second patterns entirely through the photosensitive material -- supported at, for example, figure 10 and the description at paragraph 0046 where it is indicated that either the exposed portions 50 and 70 of photoresist 30 can be removed relative to the unexposed portions 52, or vice versa.

Claim 16 is thus supported by the originally-filed application.

Referring next to claims 27 and 33, the Examiner contends that the recitations of such claims lacking support in the originally-filed application are those recitations which indicate that a first pattern formed from first exposure of photosensitive material through a reticle has features interspersed with a second pattern formed from second exposure of the photosensitive material through the reticle. Applicant respectfully submits, however, that such recitations are supported at, for example, figure 8 where features 70 formed from

second exposure of photosensitive material through a reticle are interspersed with features 50 formed through first exposure of the photosensitive material through the reticle, as well as by figure 17 where features exposed by first and second exposures of photosensitive material through a reticle are interspersed.

The Examiner further contends that a recitation of claim 27 lacking support is the recitation of photosensitive material having no portion exposed to both first light from a first exposure through a reticle and second light from a second exposure through the reticle. Applicant respectfully submits, however, that such recitation of claim 27 is supported by, for example, figure 8 which shows exposure patterns 50 formed by a first exposure entirely not overlapping with exposure patterns 70 formed by a second exposure so that no portion of the photosensitive material 30 has been exposed to light from the first exposure and additionally to light from the second exposure. Such is further explained at paragraph 0044 where it is indicated that the invention can also include aspects in which features formed by the second exposure joined with features formed by the first exposure, but that the shown aspect has the features formed from the first exposure being discrete from those formed from the second exposure.

Claims 1-26 stand rejected as being unpatentable over Murooka. Applicant respectfully requests reconsideration of such rejections.

Referring to claim 1, such specifically recites that a pair of exposures through a reticle form first and second patterns across a photosensitive material, with such patterns containing regions exposed by the first and second exposures, respectively (with such regions being specifically recited as regions exposed to first and second light, respectively),

and regions which are not exposed by the first and second exposures. The claim further recites that **an entirety** of either the exposed regions or the unexposed regions are extended entirely through the photoresist material.

Thus, claim 1 recites that each exposure through the reticle individually forms a pattern which is extended through the photosensitive material (with the pattern corresponding to either exposed or unexposed regions depending on whether the photosensitive material is a positive material or negative material, consistent with the explanation at paragraph 0046 of the application). In contrast, Murooka teaches applications in which multiple exposures through a reticle **together** form a pattern, rather than individually forming patterns. Specifically, Murooka teaches processes of utilizing multiple overlapping exposures of photosensitive material through a reticle in which none of the single exposure patterns is individually extended through the photosensitive material, but rather only regions where the patterns overlap with one another are extended through the photosensitive material. See, for example, figures 2A through 2C of Murooka where it is shown that only overlapping regions of multiple exposures are extended into a photosensitive material. Accordingly, Murooka does not teach the recited aspect of claim 1 of extending an **entirety** of either an exposed region or in unexposed region through photosensitive material, in that at least some of the region of photosensitive material exposed by the procedure of Murooka will not be exposed to overlapping patterns of radiation, and thus will not be part of the pattern transferred into the photosensitive material of Murooka.

Alternatively considered, Murooka teaches that only regions of photosensitive material exposed to both first light in a first exposure and second light in a second exposure are exposed to sufficient radiation to subsequently form a pattern in the photosensitive material, and that regions exposed to only the first light or only the second light lack the sufficient exposure to form the pattern. Thus, Murooka relies on having only regions of the photosensitive material exposed to both the first light in the first exposure and the second light in the second exposure being sufficiently exposed to form a pattern in the photosensitive material, and thus cannot reasonably be inferred teach the claim 1 recitation of having all portions of the photosensitive material exposed to the first light or the second light be sufficiently exposed to pattern the photosensitive material.

For the reasons discussed above, claim 1 is allowable over Murooka.

Claims 2-8 depend from claim 1 and are thus allowable over Murooka for at least the reasons discussed above regarding claim 1.

Claims 9 and 16 contain recitations similar to that discussed above regarding claim 1 in which an entirety of either exposed or unexposed regions are transferred into photosensitive material, and thus are allowable for reasons similar to those discussed above regarding claim 1.

Claims 10-15 and 17-26 depend from claims 9 and 16, and are thus allowable over Murooka for at least the reasons for which claims 9 and 16 are allowable over such reference.

Claims 1-38 stand rejected for obviousness-type double patenting relative to claims of U.S. Patent No. 6,670,109. Applicant respectfully requests that this rejection be held in

abeyance until all other rejections against the claims have been resolved. Applicant notes that double patenting requires comparison of the claims that would issue in the present application relative to those that have issued in the cited patent. It is respectfully submitted that such comparison cannot be undertaken until it is known what the claims will be in the present application that would issue but for the double patenting. Applicant respectfully submits that the Examiner may reconsider the issue of double patenting at a further stage of the prosecution of this application should the claims be amended, and may withdraw some or all of the double patenting rejections. If the Examiner still considers the double patenting rejection to be appropriate once all other issues regarding the claims have been resolved and the claims are otherwise in condition for allowance, applicant will at that time address the double patenting rejection.

Respectfully submitted,

Dated: April 17, 2006

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